mn

Notice of Allowability	Application No.	Applicant(s)
	10/798,905	MEHAFFY ET AL.
	Examiner	Art Unit
	Michael Yaary	2193

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address--
All claims being allowable, PROSECUTION ON THE MERITS IS (OR REMAINS) CLOSED in this application. If not included herewith (or previously mailed), a Notice of Allowance (PTOL-85) or other appropriate communication will be mailed in due course. **THIS NOTICE OF ALLOWABILITY IS NOT A GRANT OF PATENT RIGHTS.** This application is subject to withdrawal from issue at the initiative of the Office or upon petition by the applicant. See 37 CFR 1.313 and MPEP 1308.

1. ☒ This communication is responsive to *08/02/2007*.

2. ☒ The allowed claim(s) is/are *1, 3-8, 10-14 and 16-20*.

3. ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

    a) ☐ All   b) ☐ Some*   c) ☐ None   of the:

        1. ☐ Certified copies of the priority documents have been received.

        2. ☐ Certified copies of the priority documents have been received in Application No. _____ .

        3. ☐ Copies of the certified copies of the priority documents have been received in this national stage application from the International Bureau (PCT Rule 17.2(a)).

    * Certified copies not received: _____ .

Applicant has THREE MONTHS FROM THE "MAILING DATE" of this communication to file a reply complying with the requirements noted below. Failure to timely comply will result in ABANDONMENT of this application. **THIS THREE-MONTH PERIOD IS NOT EXTENDABLE.**

4. ☐ A SUBSTITUTE OATH OR DECLARATION must be submitted. Note the attached EXAMINER'S AMENDMENT or NOTICE OF INFORMAL PATENT APPLICATION (PTO-152) which gives reason(s) why the oath or declaration is deficient.

5. ☐ CORRECTED DRAWINGS (as "replacement sheets") must be submitted.

    (a) ☐ including changes required by the Notice of Draftsperson's Patent Drawing Review (PTO-948) attached

        1) ☐ hereto or 2) ☐ to Paper No./Mail Date _____ .

    (b) ☐ including changes required by the attached Examiner's Amendment / Comment or in the Office action of Paper No./Mail Date _____ .

    Identifying indicia such as the application number (see 37 CFR 1.84(c)) should be written on the drawings in the front (not the back) of each sheet. Replacement sheet(s) should be labeled as such in the header according to 37 CFR 1.121(d).

6. ☐ DEPOSIT OF·and/or INFORMATION about the deposit of BIOLOGICAL MATERIAL must be submitted. Note the attached Examiner's comment regarding REQUIREMENT FOR THE DEPOSIT OF BIOLOGICAL MATERIAL.

Attachment(s)

1. ☐ Notice of References Cited (PTO-892)

2. ☐ Notice of Draftperson's Patent Drawing Review (PTO-948)

3. ☐ Information Disclosure Statements (PTO/SB/08), Paper No./Mail Date _____

4. ☐ Examiner's Comment Regarding Requirement for Deposit of Biological Material

5. ☐ Notice of Informal Patent Application

6. ☒ Interview Summary (PTO-413), Paper No./Mail Date *20070816* .

7. ☒ Examiner's Amendment/Comment

8. ☒ Examiner's Statement of Reasons for Allowance

9. ☐ Other _____ .

MENG-AL J. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100

EXAMINER'S AMENDMENT

1.   An examiner's amendment to the record appears below. Should the changes

and/or additions be unacceptable to applicant, an amendment may be filed as provided

by 37 CFR 1.312. To ensure consideration of such an amendment, it MUST be

submitted no later than the payment of the issue fee.

Authorization for this examiner's amendment was given in a telephone interview

with Joseph T. Van Leeuwen on 08/15/2007.

The application has been amended as follows:

Listing of Claims:

1.   A computer implemented method comprising:

receiving requests for a shared resource, wherein access to the shared resource

is controlled with a software lock;

detecting that the software lock is unavailable;

executing an operating system trace hook in response to the detecting, wherein

the operating system trace hook records lock usage data, wherein the lock usage data

includes a timestamp corresponding to each request, a lock address corresponding to

an address of the software lock, a stack call chain for each process making one of the

requests at the time the corresponding request was made, and a request count; and

analyzing the recorded lock usage data to identify contended locks and processes that may not be efficiently using software locks.

2.   (Canceled)

3.   The method of claim 1 further comprising:

receiving a lock release request from a process that currently holds the software lock;

determining whether other processes are currently waiting for the software lock;

emitting a second operating system trace hook and releasing the software lock in response to determining that other processes are currently waiting for the software lock, wherein the second operating system trace hook is also adapted to record lock usage data; and

releasing the software lock without emitting a trace hook in response to determining that other processes are not waiting for the software lock.

4.   The method of claim 1 further comprising:

identifying one or more processes causing lock contention in response to the analysis of the lock usage data.

5.   The method of claim 4 further comprising:

modifying the identified processes' usage of the shared resource.

6.   The method of claim 1 further comprising:

detecting that the software lock is available in response to receiving the request;

incrementing a lock counter that tracks the number of times the shared resource was

requested; and

setting ownership of the software lock to an identifier corresponding to an

identifier of the requesting process.

7.   The method of claim 6 wherein the setting ownership further includes:

requesting that a lock ownership field of the software lock be set to the

requesting process identifier; and

receiving a completion code indicating that the ownership has been set, wherein

the incrementing of the lock counter is performed in parallel with the setting ownership

by incrementing the lock counter after the request for the lock ownership field has been

set and before the completion code has been received.

8.   An information handling system comprising:

one or more processors;

a memory accessible by the processors;

one or more shared resources accessible by the processors;

a nonvolatile storage device accessible by the processors;

one or more software locks, stored in the memory, for controlling access to the

shared resources;

an operating system that controls a plurality of processes performed by the

processors, the operating system including a trace hook facility;

and a software lock measurement tool for measuring lock contention, the

software lock measurement tool including instructions that, when executed by at least

one of the processors, cause the information handling system to perform the steps

comprising:

receiving requests from one or more of the processes for one of the shared

resources, wherein access to the shared resource is controlled with one of the software

locks;

detecting that the software lock is unavailable;

executing an operating system trace hook in response to the detecting, wherein the

operating system trace hook records lock usage data, wherein the lock usage data

includes a timestamp corresponding to each request, a lock address corresponding to

an address of the software lock, a stack call chain for each process making one of the

requests at the time the corresponding request was made, and a request count; and

analyzing the recorded lock usage data to identify contended locks and

processes that may not be efficiently using software locks.

9.   (Canceled)

10.   The information handling system of claim 8 wherein the software lock

measurement tool includes further instructions that, when executed by at least one of

the processors, cause the information handling system to perform further steps

comprising:

        receiving a lock release request from a process that currently holds the software

lock.

        determining whether other processes are currently waiting for the software lock;

        emitting a second operating system trace hook and releasing the software lock in

response to determining that other processes are currently waiting for the software lock,

wherein the second operating system trace hook is also adapted to record lock usage

data; and

        releasing the software lock without emitting a trace hook in response to

determining that other processes are not waiting for the software lock.

11.   The information handling system of claim 8 wherein the software lock

measurement tool includes further instructions that, when executed by at least one of

the processors, cause the information handling system to perform further steps

comprising:

        identifying one or more processes causing lock contention in response to the

analysis of the lock usage data.

12.   The information handling system of claim 8 wherein the software lock

measurement tool includes further instructions that, when executed by at least one of

the processors, cause the information handling system to perform further steps

comprising:

        detecting that the software lock is available in response to receiving the request;

        incrementing a lock counter that tracks the number of times the shared resource

was requested; and

        setting ownership of the software lock to an identifier corresponding to an

identifier of the requesting process.

13.   The information handling system of claim 12 wherein the step of setting

ownership further includes:

        requesting that a lock ownership field of the software lock be set to the

requesting process identifier; and

        receiving a completion code indicating that the ownership has been set, wherein

the incrementing of the lock counter is performed in parallel with the setting ownership

by incrementing the lock counter after the request for the lock ownership field has been

set and before the completion code has been received.

14.   A computer program product stored on a computer storage media that includes

instructions that, when executed by an information handling system, measure lock

contention by performing steps comprising:

receiving requests for a shared resource, wherein access to the shared resource is controlled with a software lock;

detecting that the software lock is unavailable;

executing an operating system trace hook in response to the detecting, wherein the operating system trace hook records lock usage data, wherein the lock usage data includes a timestamp corresponding to each request, a lock address corresponding to an address of the software lock, a stack call chain for each process making one of the requests at the time the corresponding request was made, and a request count; and

analyzing the recorded lock usage data to identify contended locks and processes that may not be efficiently using software locks.

15.   (Canceled)

16.   The computer program product of claim 14 wherein the instructions, when executed by an information handling system, perform further steps comprising:

receiving a lock release request from a process that currently holds the software lock.

determining whether other processes are currently waiting for the software lock;

emitting a second operating system trace hook and releasing the software lock in response to determining that other processes are currently waiting for the software lock, wherein the second operating system trace hook is also adapted to record lock usage data; and

releasing the software lock without emitting a trace hook in response to determining that other processes are not waiting for the software lock.

17.   The computer program product of claim 14 wherein the instructions, when executed by an information handling system, perform further steps comprising:

identifying one or more processes causing lock contention in response to the analysis of the lock usage data.

18.   The computer program product of claim 14 wherein the instructions, when executed by an information handling system, perform further steps comprising:

modifying the identified processes' usage of the shared resource.

19.   The computer program product of claim 14 wherein the instructions, when executed by an information handling system, perform further steps comprising:

detecting that the software lock is available in response to receiving the request;

incrementing a lock counter that tracks the number of times the shared resource was requested; and

setting ownership of the software lock to an identifier corresponding to an identifier of the requesting process.

20.   The computer program product of claim 19 wherein the step of setting ownership further includes steps comprising:

requesting that a lock ownership field of the software lock be set to the

requesting process identifier; and

receiving a completion code indicating that the ownership has been set, wherein

the incrementing of the lock counter is performed in parallel with the setting ownership

by incrementing the lock counter after the request for the lock ownership field has been

set and before the completion code has been received.

REASONS FOR ALLOWANCE

2.   Claims 1, 3-8, 10-14, and 16-20 are allowed.

3.   The following is an examiner's statement of reasons for allowance:

4.   The prior art of record fails to teach or suggest executing an operating system

trace hook in response to the detecting that a software lock is unavailable, wherein the

operating system trace hook records lock usage data, wherein the lock usage data

includes a timestamp corresponding to each request, a lock address corresponding to

an address of the software lock, a stack call chain for each process making one of the

requests at the time the corresponding request was made, and a request count, as

recited in independent claims 1, 8, and 14.

5.   Any comments considered necessary by applicant must be submitted no later

than the payment of the issue fee and, to avoid processing delays, should preferably

accompany the issue fee. Such submissions should be clearly labeled "Comments on

Statement of Reasons for Allowance."

         Any inquiry concerning this communication or earlier communications from the

examiner should be directed to Michael Yaary whose telephone number is (571) 270-

1249. The examiner can normally be reached on Monday-Friday, 8:00 a.m - 5:00 p.m..

         If attempts to reach the examiner by telephone are unsuccessful, the examiner's

supervisor, Meng-Ai An can be reached on (571) 272-3756. The fax phone number for

the organization where this application or proceeding is assigned is 571-273-8300.

         Information regarding the status of an application may be obtained from the

Patent Application Information Retrieval (PAIR) system. Status information for

published applications may be obtained from either Private PAIR or Public PAIR.

Status information for unpublished applications is available through Private PAIR only.

For more information about the PAIR system, see http://pair-direct.uspto.gov. Should

you have questions on access to the Private PAIR system, contact the Electronic

Business Center (EBC) at 866-217-9197 (toll-free). If you would like assistance from a

USPTO Customer Service Representative or access to the automated information

system, call 800-786-9199 (IN USA OR CANADA) or 571-272-1000.

MENG-AL T. AN
SUPERVISORY PATENT EXAMINER
TECHNOLOGY CENTER 2100